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Diag. Cht. No. 9370 & 9302

U. S. COAST AND GEODETIC SURVEY.

Henry S. Pritchett, Superintendent.

State: Alaska

DESCRIPTIVE REPORT.

Hydrographic *Sheet No.* 2362

LOCALITY:

Entrance to the Aphoon Mouth of the Yukon River

1898.

CHIEF OF PARTY:

J. F. Pratt, Assistant

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U. S. Coast and Geodetic Survey,
Dr. H. S. Pritchett,
Superintendent.

Hydrography and Topography
of the
Aphoon Entrance to the Yukon River, Alaska.
by the
Party in charge of J.F.Pratt, Assistant.
Begun August 15, 1898
Finished Sep. 12, 1898

Topography from plane table survey by G.H.Pratt.

Hydrography,

Observers,	Recorders
G.R.Putnam, Assistant.	G.H.Pratt,
R.L.Faris "	G.A.Huntley,
A.L.baldwin, "	C.Van Wyck,
R.E.Derickson, Aid	

Leadsmen,
John Beaurman,
Johan Johansen,
W. Anderson,

Scale 1/20,000.

Statistics. (Hydrography on sheet "Aphoon Entrance to Yukon River")

Date	Letter	Number of Vol.	Angles or positions	Soundings	Miles (statute)	Vessel,
1898	blue					
Aug.17	g	1	20	428	7	Launch Alpha
" 19	h	1&2	111	2187	28	" "
" 20	i	2	11	387	4	"
" 22	j	2	23	152	1,6	"
Total			165	3154	40,6	
Aug.20	red b	16	64	1871	11,5	Whaleboat No.1
Aug.15	green f	1	18	282	2	On foot
Aug.19	brown E	11	2	4	4	Str."Taku"
Sept.12	yellow B	15	8	20	2,5	Str."Yukon"

Recapitulation,

Launch "Alpha"	165	3154	40,6
Whaleboat No.1	64	1871	11,5
On foot	18	282	2,
Steamer"Taku"	2	4	4,
Steamer"Yukon"	8	20	2,5
Grand total	257	5331	60 ,6

257

sq. miles.

ON ORIGINAL DOCUMENT

The tides used in reducing soundings, will be found in record of Observations of Tides at Pastoliak Station.

For September 12'th, the reductions are derived from the record of the self registering tide gauge at St. Michael on September 13'th and September 14'th 1898.

The plane of reference used for the reduction of soundings, is the mean of low waters and corresponds to tide gauge reading, 3,04 feet on the Pastoliak Tide Staff.

The highest tide observed at the station was 8,4 feet on Pastoliak staff, August 15'th, at 5^h A.M.

The lowest tide observed, was 2,2 feet on Pastoliak staff, August 15'th, at $4^h 40^m$ P.M.

The mean rise and fall for eight days was 4,0 feet, (Maximum 6,2 feet, minimum 1,9 feet.)

Difference in Time ---------of----------High Water.
between
St. Michael and Aphoon Entrance, (Pastoliak Tide Staff.)

Date 1898	St.Michael h	St.Michael m	Pastoliak h	Pastoliak m	St.M−Past. h	St.M−Past. m	Wind at St. Michael force miles	Wind at St. Michael Direction
August 15	5	40	5	00	+ 0	40	12	S.E.
" 16	7	00	6	00	+	60	5	S.
" 17	6	50	6	00	+	50	3	N.
" 18	7	00	7	10	−	10	10	NE.
" 19	8	20	7	30	+	50	8	NE.
" 20	9	50	7	52	+	118	12	NE.
" 21	11	00	8	30	+	150	6	S.
" 22	0	00	9	30	+	150	8	S.

Mean + 1^h 16^m

That is, high water, (mean of 8 days) is about 1^h 16^m earlier at the Aphoon Entrance than at St. Michael, with a range of uncertainty of about 1^h 20^m.

Difference in Time----------of----------Low Water,
between
St. Michael and Aphoon Entrance. (Pastoliak Tide Staff.)

Date 1898	St.Michael h	m	Pastoliak h	m	St.M–Past. h	m	Wind at St.Michael force miles	direction
August 11	13	20	14	15	− 0	55	1	SW.
" 12	14	40	--	--	--	--	4	N.
" 13	14	30	14	00	+	30	1	S.
" 14	15	50	15	30	+	20	6	SE.
" 15	15	50	16	30	−	40	12	SE.
" 16	17	00	16	00	+	60	5	S.
" 17	16	30	16	00	+	30	3	N.
" 18	16	40	16	30	+	10	10	NE.
" 19	17	20	17	00	+	20	8	NE.
" 20	18	30	16	52	+	98	12	NE.
" 21	14	40	16	00	−	60	6	S.
" 22	6	00	5	00	+	60	8	S.
			Mean		+	14		

That is, low water, (mean of 11 days) occurs about $0^h\ 14^m$ earlier at the Aphoon Entrance than at St. Michael, with a range of uncertainty of about $1^h\ 30^m$.

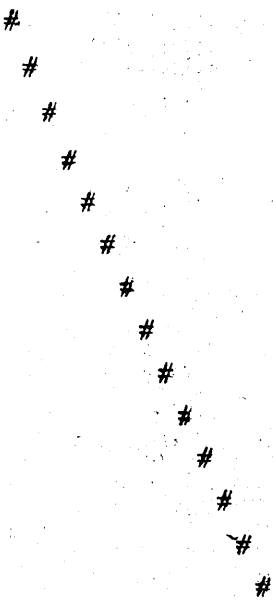
Comparison of High Water and Low Water slack from St. Michael Self Registering Tide Gauge to Tide Staff at Pastoliak.

Date 1898.	H.W. St.M.	H.W. Past.	St.M− Past.	L.W. St.M.	L.W. Past.	St.M+ Past.	Wind at St.Michael force miles	direction
Aug. 10	---	4,25	---	---	---	---	0,8	N.W.
" 11	---	---	---	3,00	3,58	−0,58	1,	S.W
" 12	---	---	---	---	---	---	4,	N.
" 13	---	---	---	3,40	3,25	+0,15	1,	S.
" 14	---	---	---	3,10	2,95	+0,15	6,	S.E.
" 15	8,10	8,40	−0,30	3,40	2,20	+0,20	12,	S.E.
" 16	7,90	7,30	+0,60	3,50	3,10	+0,40	5,	S.
" 17	7,40	7,92	−0,52	2,80	3,10	−0,30	3,	N.
" 18	7,00	8,00	−1,00	3,10	3,25	−0,15	10,	N.E.
" 19	6,40	6,87	−0,47	2,40	2,70	−0,30	8,	N.E.
" 20	6,30	6,70	−0,40	3,30	3,35	−0,05	12,	N.E.
" 21	4,40	4,75	−0,35	3,50	2,78	+0,72	6,	S.
" 22	6,00	6,42	−0,42	[5,50]	3,58	---	8,	S.
" 23	---	5,45	---	---	3,62	---	---	---
Means			−0,36			+0,02		

Weighted mean,----- =−0,14

Adopted mean low water at St. Michael,---- = 2,90

" " " " " Pastoliak, ------= 2,90+0,14= 3,04feet



Descriptive matter pertaining to the Aphoon Entrance, Yukon River, Alaska.

Commerce,

The Aphoon (pronounced Ap-hoon) Mouth has been almost exclusively used in entering the Yukon River by the river steamers ever since the beginning of traffic on the Yukon. During the summer of 1898 one or two steamers entered the Kussilvak or south mouth, and one steamer is said by the natives, to have entered the Okwega branch of the Aphoon, but the great bulk of the commerce has gone through the main Aphoon Mouth. During the season of 1898 between 60 and 70 steamboats, of regular lines, many making two or more round trips, besides a large number of small steam craft, of all descriptions and a few small steam schooners of light draft, have used this entrance.

Topography,

The Aphoon Mouth is the extreme northeasterly limit of the Yukon Delta, and in common with the rest of this region, the country is low and flat, but a few feet above high water. Down to within about two miles of its mouth the Aphoon banks are generally covered with low bushes, willow and alder, averagehng 8to10 feet in height. Near the mouth the land becomes more marshy and a considerable area to the westward, (probably an island) appears to be e entirely open marsh. The flat open country but a few feet above high water and covered with grassand marsh or ponds, extends along the coast to the eastward to the limits of the sheet, beyound the Pastoliak River Mouth. Near the eastern extremity of the sheet, about two and one half miles back from the shore line, is a flat topped hill, (called by the party this season "Hog Back", Esquimo name "Chu-ni -yo-hok"), about three hundred feet in elevation,

Some distance back from the coast is seen the range of mountains trending to the southwestward, whicd approach the Yukon near Andreafski. These mountains are soon lost to view soon after entering the Aphoon.

On the low flat shores there are often remarkable mirage effects tending to greatly magnify insignificantobjects.

Sailing Directions,

The usual course of river steamers, coming from St. Michael, after passing between St.Michael and Stewart Islands, is to steer slightly to the westward of Pt. Romanoff, which can be seen from the pass between the islands in clear weather; after passing this Point, about a mile off shore, the course is laid so as to closely approach the shore at the Point about half way between the Pastoliak and the Pastolik Rivers. From this point there is a well defined channel following the shore,closely, for about a mile and a quarter where it forks, the one branching off here to the left, of about the same depth,leads into the Pastolik River, while the Aphoon abruptly turns to the right, in a northwesterly direction and continues about threefourths of a mile when it turns to the left in a westerly direction and continues for about one and one quarter miles, where it passes close to Aphoon Point, whhch is on the south side of the entrance.

For some miles after entering the Aphoon, the channel is devious and difficult, and about six miles up, at the junction of the Kotlik River, is a very misleading crossing, which has however about five feet of water at low tide.

To the northwestward of the mouth of the Pastoliak River the bottom is very flat, with apparently no defined channel and little preference as to course. These great flats cannot be crossed at low tide, except by unusually light draft boats, and steamers leaving St. Michael generally plan to reach here it high water. Many however wait for the tide on either side,or groundon the flats. After reaching the channel, near the shore, between the Pastoliak and Pastolik Rivers, boats not drawing much over four feet can proceed into and up the Aphoon at low tide. The mouth of the Pastoliak River is said to have been used as a harbor of refuge during storms by small river steamers. The bottom and shores of all this area are alluvial, no rocks exist and no snags are found in the channel.

River steamers in general cary Esquimo pilots, who may be hired at St. Michael and at various places on the river. They are as a rule only familliar with a portion of the river, those from St. Michael usually going as far as Andreafski. A number of pilots (natives) live at the village near the mouth of the Pastolic River A pilot is necessary in entering and following the Aphoon and Kwikpak channels. The Eskimos are generally quick witted and have a good eye for the water, but some who offer their services as pilots have little idea of the requirements of a steamer, being used only to their own skin boats.

River steamers anchor on the flats or in the channel, wherever exigency demands. In moderate weather the ocean swell is not felt between St. Michael's Island and the Apoon entrance, but in heavy northerly and westerly weather, which is more liable to occur during the latter portion of the season, there is a choppy sea, which is much heavier off Point Romanoff than elsewhere, in general, after rounding the north end of St. Michael Island, the passage is sife, for river steamers, in the summer season. During the latter part of the season, however, high winds become frequent and the boats are obliged to watch their opportunities.

The natural current of the Apoon is more sluggish than other mouths of the river, but there is a tidal inflow and outflow, the strength of which depends upon the amount of the rise and fall of the tide.

The following are the dates of the arrival of the first river steamers from the Yukon at St. Michael, (taken from the log of the Alaska Commercial Company) which gives some idea of the opening of navigation in the lower river. These dates are, in general, two or three weeks ealier than the arrival of the first ocean vessel at St. Michael, as the river opens before Norton Sound is clear of ice.

June	10,	1883.	June	7,	1891.
"	17,	1884 .	"	7,	1892.
"	15,	1887.	"	14,	1893.
"	8,	1888.	"	18,	1894.
"	13,	1889,	"	19,	1895.
"	6,	1890.	"	27,	1896.
			"	22,	1son.

In the autumn, thin ice begins to run in the river the latter part of September and navigation ~~and navigation~~ on October is attended with danger of being frozen in. It is more than probable that the movement and clogging of the ice in the breaking up of the river, in the spring, has much to do whth the location and peculiarites of the channels and with clearing from snags.

Water and Wood.

Immediately within the Aphoon Entranle the water is fresh and that on the flats outside , close in , is nearly so, the degree of freshness depending on the stage of the tide.

Cord wood is cut and sold by the natives along the river, from the mouth up, wood piles can be seen at frequent intervals. That near the mouth is of inferior quality, being cut from drift-wood. The price of cord wood as well as of pilot services has been very materially raised since the beginning of the Klondike excitement.

The first white resident southwest from St. Michael is a half breed Russiin trader, by the name of Komkoff, living at Kotlik, about six miles from the Aphoon Mouth and on the Kotlik River, a short distance from the Aphoon. Here is a store, a rude church and a few dwellings. There is no other white settlement until Fort Hamilton is reached,near the other end of the Apdoon Channel where there is a station of the North American Trading and Transportation Co. The natives are mostly migratory, living at various places at different seasons. Their principal settlement, after leaving St. Michiel's Island is on the Pastolik River.

They are generally good natured, friendly and honest.

The tides at this Entrance, as is the case with the eastern shores of Norton Sound, are greatly effected by the winds, northerly and easterly ones making low waters and southerly and westerly ones making high ones. This wind effect may be sufficient to entirely obliterate the natural conditions.

The channelway and its approach, from where it begins between the Pastoliak and Pastolik Rivers to Aphoon Point, is usually staked out in a hap-hazard way by individuals, usually by those that get aground and are left high and dry over one or more tides.

The place is very difficult for a stranger to enter; each seasons ice carries away all stakes and marks and it should be systemathcally buoyed each season as soon as navigation opens.

The controll of this sheet depends on the triangulation carried from St. Michael, of whicd the last determhned point was "Kotlik". The topography was transferred from the original plane-table sheet surveyed by G.H.Pratt. The magnetic declination and dip were measured at Pastoliak triangulation station. The names of all triangulation and hydrographic signals are given in red on the sheet.

Very respectuully submitted,

G. H. Pratt

Ass't..Chief of party.